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THE PRESENT ORGANIZATION AND WORK FOR THE PROTECTION OF HEALTH IN THE UNITED STATES.^a

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In describing the present organization and work for the protection of health in the United States, in accordance with the programme of this thirty-eighth annual meeting of the American Public Health Association, I shall begin at the outmost circumference of the influence of the United States organization, viz, the protective measures at foreign ports and in our insular possessions. I shall then endeavor to describe successively the work and organization as it may be observed at sea, on reaching our coast, while passing through the States, in the hygienic laboratory, and at the central bureau in Washington.

If you should visit Japan and China, you would find medical officers of the Public Health and Marine-Hospital Service attached to the United States consulates at Yokohama, Kobe, Nagasaki, Shanghai, Amoy, and Hongkong. These officers keep themselves informed of the prevalence of contagious disease in these cities and the surrounding country. They are obliged to sign a bill of health which certifies that all the regulations required to be enforced at foreign ports on vessels leaving for the United States have been complied with.

This involves a knowledge of the point of origin of the freight and passengers, disinfection of material from an infected locality, and personal inspection of passengers, particularly steerage passengers, and their detention if necessary. The power of enforcement of these regulations lies in the act of Congress approved February 15, 1893, which imposes a penalty of \$5,000 upon any vessel from a foreign port seeking to enter a port of the United States without this consular bill of health. The consul can legally refuse a bill of health if the regulations are not complied with.

At the more important ports these are commissioned medical officers, who by experience and training have acquired a knowledge, not only technical but administrative, which permits their being

^a Read before the American Public Health Association, Milwaukee, Wis., September 8, 1910, in a symposium including like reports by representatives from Canada, Mexico, and Cuba.

trusted as sanitary guards, with sufficient tact and judgment for the somewhat diplomatic methods required in foreign ports. The others are acting assistant surgeons, chosen from the medical profession of the United States because of special experience or adaptability for the work in hand.

A commissioned officer is one who has been admitted to the corps under 30 years of age, after a physical and professional examination, appointed by the President and confirmed by the Senate. Tenure is for life.

Acting assistant surgeons are appointed, not by the President but by the Secretary of the Treasury under civil-service rules, and their term of service may be long or short, at the pleasure of the Secretary. At foreign ports they are excepted from the civil-service rules, there being thus wider latitude in their selection. The commissioned officers number 128, the acting assistant surgeons 274, making a total of 402 in the Medical Corps.

Officers are also located at Calcutta, Naples, and Libau, Russia; and whenever circumstances demand, they may be stationed in the consulate at any foreign port.

One word as to the regulations for foreign ports. They are enforced by medical officers only at certain ports and certain times, when medical assistance to the United States consul seems imperative. At all other times and places they are enforced by the consuls themselves, and are constantly operative. Thus no promulgation of quarantine against a foreign port is required. If the consul knows of a sudden outbreak of infectious disease, he must immediately enforce the published regulations. True, they are sometimes warned or specially directed from Washington, as recently, on account of cholera in Russia and Italy, they were directed by cable to enforce the required detention under observation for five days of all passengers from the infected countries and disinfection of their baggage.

Other foreign ports where these sanitary guards may be found are Santiago, Chile; Callao, Peru; Guayaquil, Ecuador; Rio de Janeiro, Brazil; La Guaira, Venezuela; and several ports in Cuba and Mexico.

Again you will find them, from the 1st of May until the 1st of November, in the several fruit ports of Central America to enforce regulations which will permit the fruit vessels to enter without delay at the ports of the United States.

All these officers are formally detailed to their respective ports by order of the President of the United States.

Besides their routine work, they also write important and instructive reports on sanitary conditions and prevailing diseases, which are published by the bureau at Washington.

Their salaries are paid from the fund annually appropriated by Congress, known as the epidemic fund, which is for the prevention of the introduction and spread of certain diseases, viz, cholera, yellow fever, smallpox, typhus fever, and plague. This fund can be used against no other diseases than those specified.

In the Philippine Islands, where the government is by commission and a legislature, much work of value to the public health is performed in the bureau of science under the insular government. There

are, however, in the several ports of the Philippines 11 medical officers of the Public Health and Marine-Hospital Service under appointment from the Treasury Department in Washington, engaged in the transactions of both incoming and outgoing quarantine. Their salaries and other quarantine expenses are paid by the insular government.

Two of these officers, in addition to their supervision of the national quarantine, are also director and assistant director, respectively, of the public health of all the Philippines.

In Hawaii you will find 10 medical officers conducting the national quarantine. They are also assisting the territorial health board in preventing the recurrence of plague by the extermination of rats and continuous bacteriological examination of those captured. During the last fiscal year 25,000 rats were examined in the laboratory, one rat being found infected with plague.

Here also may be observed the leprosy investigation station conducted by three medical officers, both on the island of Molokai, where hospital and other accommodations have been erected under the law of March 3, 1905, appropriating \$100,000 for this purpose, and at the receiving station at Honolulu, where cases are seen in the earlier stages.

The last year has witnessed the successful cultivation by these officers of the bacillus of leprosy in artificial media first achieved a short time before at Manila by Clegg, recently appointed assistant director of this station. This marks a signal advance toward success in obtaining a cure and preventive.

In Porto Rico there are 9 officers enforcing the United States quarantine regulations under the acts of Congress relating to Porto Rico and national quarantine.

The maintenance of the stations in Hawaii and Porto Rico is paid from the general appropriation of \$400,000 made annually for the Quarantine Service of the United States.

In the Canal Zone you will find two commissioned officers enforcing quarantine regulations at Ancon on the Pacific and Colon on the Atlantic. These officers are loaned to the Isthmian Canal Commission. Their salaries are paid from the regular appropriation for salaries of the officers of the Service, and added to, under the law, by the Isthmian Canal Commission.

As we approach, from foreign ports and our insular possessions, the coasts of the United States, it will be found that the vessel on which we sail is subject to certain sanitary requirements, including cleanliness, ventilation, isolation of the sick with communicable disease, and directions for disinfection.

When a ship from a foreign port arrives off a port of the United States, it is met by a quarantine officer for inspection under the national regulations. Fifty medical officers of the Service are engaged in this work at 44 separate stations, extending along the Pacific, the Gulf, and Atlantic coasts from Alaska to Portland, Me. Without the quarantine certificates given by these officers and the bill of health obtained at the foreign port, the ship would not be allowed entry by the collector of customs and without his permit it would be unlawful for the ship to unload its cargo.

At a few ports, not more than three or four in number, this inspection is made by a state quarantine officer, a remnant of the system which prevailed prior to 1893, when quarantine was considered a state rather than a national function. They are obliged, however, to enforce the national regulations, and are subject to inspection by the national officers, and if they fail or refuse to comply with the United States regulations the President will detail an officer of the Government for that purpose.

The chief national quarantine law is that approved February 15, 1893, amended and extended by acts of Congress approved August 12, 1894, March 2, 1901, and June 19, 1906.

Under these acts the maritime quarantine administration has become national, many state stations having been voluntarily surrendered to the Government, others supplanted by the General Government because of failure to comply with government regulations, and others superseded by direct authority of law.

The diseases kept out by these stations at present are cholera, yellow fever, smallpox, typhus fever, leprosy, and plague.

Some quarantine stations are inspection stations only, but many are large institutions, comprised of hospitals, quarters, barracks for detention of crews and passengers, wharves and disinfecting machinery, and boarding vessels, all requiring good administrative ability on the part of the commanding officer, who must also be expert in the detection of disease.

In addition to the diseases excluded by quarantine, others are excluded under laws relating to immigration, and for this purpose at the principal ports of entry there are also stationed 70 medical officers, who, during the past year for example, examined more than 1,280,000 immigrants, certifying more than 30,000 of them on account of physical and mental defects. The immigration laws exclude persons afflicted with any loathsome or any dangerous contagious disease, or who have mental or physical defects which may affect their ability to earn a living.

Humanity requires the treatment in hospital of immigrants arriving sick with ordinary as well as prohibitive diseases, and the large hospitals connected with the stations are under the professional conduct of the Service officers.

Although the immigration stations are under the control of commissioners attached to the Department of Commerce and Labor, nevertheless the medical officers are subject in their professional work to supervision by the Bureau of Public Health and Marine-Hospital Service, and their instructions as to the medical inspection of aliens are prepared by the Surgeon-General, approved by the Secretary of the Treasury.

Passing from the coast line of the United States toward the interior, officers may be found from time to time in the several States engaged in suppressing epidemic diseases which threaten to spread from one State to another; as, for example, the yellow fever in Brunswick in 1893, New Orleans in 1897, Laredo, Tex., in 1903, and New Orleans again in 1905; and the bubonic plague in California in 1900 and again in 1907-8; and even at the present time in the extermination of bubonic plague among the ground squirrels in California.

These operations are conducted under two laws. One is the national quarantine act of 1893, already referred to, which contains practically the same provisions for interstate as for maritime quarantine. The other is the annual law passed by Congress appropriating an "epidemic fund," which contains a provision that it may be used in aid of State and local boards of health in the enforcement of their quarantine regulations, as well as those of the national service—to be used, however, only against certain specified epidemic diseases, viz, cholera, yellow fever, smallpox, typhus fever, and bubonic plague.

Now, with these two laws in hand, and when the appearance of any of the above-named diseases in any State so requires, the officers of the Public Health Service are at once upon the scene with the double object of seeing that the Treasury Interstate Quarantine Regulations are enforced by the state or local authorities and to offer aid, as authorized by law.

When aid is extended, the Government's funds must be expended by its own officers, and the latter are therefore placed in charge and have the cooperation and assistance of the state or local authorities. They have, therefore, the support of the state and local laws and regulations, as well as those of the Federal Government. This is fortunate, since experience has shown the importance, in a democratic country like ours, of local sympathy and support.

Passing now further into the interior, the Public Health Service may be found in the States investigating other diseases than those named in the epidemic law, viz, typhoid fever, infantile paralysis, cerebro-spinal meningitis, hookworm disease, pellagra, dengue fever, milk sickness, etc. These investigations are usually made at the request of state health authorities. The bureau at Washington, on receiving a request from a city or locality for expert aid, invariably refers the request to the state board of health before compliance.

The laws permitting these investigations are, first, the interstate section of the quarantine law of 1893; and, second, the act of Congress approved March 3, 1901, providing a building for the Hygienic Laboratory for investigation of contagious and infectious diseases and matters relating to the public health. As the investigations require laboratory examinations, they come within this last-named law and the appropriation which supports it.

In various States of the Union, there are 13 establishments engaged in the production of vaccines, antitoxins, and serums, which play so important a part in modern therapy. The variation in the potency and the occasional impurity of these products caused Congress to pass an act, July 1, 1902, requiring a license for their manufacture for sale in interstate traffic.

Prior to this license, which is given by the Secretary of the Treasury, and also prior to its required annual renewal, a careful inspection of the plant in all its details and methods is made by officers specially qualified, these inspections being supplemented by examinations in the Hygienic Laboratory. A demand is made for the correction of any fault, and the correction must be made before the license is issued.

In passing through the States toward the national bureau at Washington, it will be observed that each individual State has its own health department or state board of health, which holds a relation to the counties and municipalities of the State analagous to that existing between the national and state governments. There are 46 States, and therefore 46 state boards of health or state departments of health. Under their police powers they come more directly in contact with local conditions and have more intimate relations with persons than the National Government. They are important units in the health organization of the country, being formally recognized in the statutes of the United States and linked with the national health organization by the law of July 1, 1902, which requires the Surgeon-General of the Public Health and Marine-Hospital Service each year to call into conference representatives from all the state boards, and permits him to call a part or all when necessary. Moreover, the States themselves have the right at any time to demand that the Surgeon-General shall call a conference of as many States as join in the demand, provided not less than five States so join.

The results of these conferences are an exchange of information, a spirit of cooperation, and the determination of scientific and administrative measures. The Service gives the results of its own observations and findings and is benefited by the experience and counsel, especially in practical matters, of the delegates from the state boards.

Incidentally it may be mentioned that for its research and other scientific work the Service has by law in the Hygienic Laboratory the advice of an advisory board, nine in number, composed of scientists, eminent in laboratory work, both of other departments of the Government and of endowed institutions.

The state boards of health are growing in power and efficiency. The first to be established was that of Massachusetts in 1869. In the following ten years, or to 1880, eighteen state boards were organized; from 1880 to 1890, fourteen; from 1890 to 1900, seven; and from 1900 to 1909, seven.

I shall not attempt to narrate their duties, which relate to all measures affecting the public health of the State. It is true the boards of some States are deficient as to laws, equipment, or appropriations—defects which an aroused public sentiment must correct—but each year witnesses the passage of important health legislation in many States.

As to municipal boards of health, time permits only a reference, but many of them are working out their municipal health problems with remarkable efficiency.

The relation of the National Government to the States and municipalities in public health has been partly set forth in the foregoing pages. In some respects this subject is still *sub judice*, dependent on construction of the United States Constitution; but in the words of another, "the cardinal duties of the Federal Government in conserving the public health are, first, the prevention of the introduction of contagious and infectious diseases from without as well as their spread from one State or Territory to another; second, the investigation of communicable diseases, the conditions favoring their spread, and the measures necessary for their prevention; third, the dissemination of sanitary information thus acquired; and, fourth, cooperation with state and local authorities for the protection of life and health."

Without question, it is the right and duty of the General Government to engage in the most thorough scientific investigations, to collect all possible statistics, and to publish broadcast important sanitary and hygienic information.

In the District of Columbia, in a commodious building, is the Hygienic Laboratory, a research laboratory exclusively for public-health investigations. It is conducted in four divisions, viz, bacteriology and pathology, chemistry, zoology, and pharmacology. This organization brings under the same roof, and with intimate association, scientific workers in each of these several branches, interesting facts developed in one line of investigation being made freely known to the investigators in the other lines of research.

Officers are detailed to receive instruction in this laboratory, thus enhancing the scientific attainments of the corps and giving opportunity for selection of those best qualified for permanent detail in research work. In this manner specialists have been and are being developed on various subjects, such as typhoid fever, pellagra, hookworm disease, infantile paralysis, scientific disinfection, etc. Eleven commissioned officers were on duty during the last year.

The research work during the past year included tuberculosis, with special reference to the blood and transmission of the disease by milk; typhoid fever and hookworm disease, the longevity of their causative agents and means necessary for their destruction in nature; typhus fever and its transmission by the body louse; pellagra; infantile paralysis; cancer in the lower animals; the "straw mattress disease;" immunity; the oxydases, with reference to their defensive action in the animal body; the influence of bleaching on the nutritive value of flour; therapeutic properties of the thyroid and suprarenal glands and their commercial preparations.

Examinations were made of commercial disinfectants and embalming fluids, standards of each being recommended; pharmacopœial preparations; and 122 samples of water from the District of Columbia.

Investigations included viruses, serums, and toxins, used in the treatment of disease, and standard units were prepared for antidiphtheric and antitetanic serums.

Other transactions were the identification of the animal parasites of man, studies of rabies, and the administration of antirabic treatment to 59 persons and transmitting to state health authorities and to the Canal Zone material for antirabic treatment.

Digests of Comments on the Pharmacopœia were published in two volumes, and in all 13 Hygienic Laboratory bulletins were issued. The personnel of the laboratory numbered 52. It is open for special instruction to state and municipal health officers.

To complete the description of the field work, or work outside the bureau at Washington, it is necessary to speak of the marine-hospital relief stations on the seacoast, lakes, and rivers throughout the United States, 22 of them being hospitals owned and operated by the Government. While forming but one of seven of the administrative branches, they are important to the Public Health Service. They furnish the means for training the medical corps in governmental work. They keep it in active professional practice, 51,500 patients from the merchant marine being treated in the last fiscal year.

They serve as sanitary outposts through which the public-health functions of the Service may be more effectively carried out, and by which surveillance may be had over the migration of infectious diseases. In times of epidemics the trained officers of these stations are mobilized at the point of danger. From them frequently the first warnings come, and at many of the stations the officers are identified with important health movements.

They contribute to the saving from disaster by examination of pilots for color blindness and other defects of vision, 41 being rejected out of 919 examined in the last fiscal year; and by weeding out and debarring the physically incompetent from the crews of the Life-Saving Service, 62 having been rejected out of 1,789 examined.

The Sanatorium for Consumptive Seamen at Fort Stanton, N. Mex., where 350 are treated annually, assists in the prevention of the spread of tuberculosis and furnishes opportunity for scientific studies of the disease.

The Bureau of the Public Health and Marine-Hospital Service at Washington consists of seven distinct divisions, each presided over by a commissioned medical officer. These divisions are:

- (1) Scientific research and sanitation.
- (2) Foreign and insular quarantine and immigration.
- (3) Domestic (interstate) quarantine.
- (4) Sanitary reports and statistics.
- (5) Marine hospitals and relief.
- (6) Personnel and accounts.
- (7) Miscellaneous division.

Each division has special quarters and a special clerical force.

Now, all the officers in the outside service, whether at foreign ports, insular possessions, quarantine stations, immigration stations, those engaged in suppressing epidemics, in conducting the Marine-Hospital relief stations, or in scientific investigations of disease in the field or in the laboratory—all come under the jurisdiction of one or other of these divisions of the bureau. The operations of the divisions are coordinated and brought under the direct supervision of the Surgeon-General by special bureau regulations.

The field covered by each division is partly indicated by its title and the foregoing statements. In addition there were, however, conducted through the division of scientific research and sanitation the following, viz: A thorough investigation and report on mercury-vapor illumination as affecting vision, this illumination being used in the government departments and elsewhere; a collective investigation concerning the milk dispensaries in the United States and their utility in the prevention of infant mortality; the proceedings of a commission to investigate pellagra, said commission being composed of seven scientists, five connected with the Hygienic Laboratory and two with the Government Hospital for the Insane; and a continuation of the labors of the typhoid board in the District of Columbia, whose fourth and final report will soon be issued.

Thirteen foreign establishments were licensed during the year for the sale in the United States of vaccines, serums, and toxins after inspection. Shipments of these products from abroad are held at ports of entry pending examinations of samples.

The division of scientific research and sanitation supervises the detail and the reports of officers ordered to attend national and state medical societies and sanitary organizations and prepares for publication the proceedings of the conferences between the service and state boards. It conducts the correspondence relating to the International Sanitary Conferences of the American Republics and the International Sanitary Office at Paris, and other correspondence with foreign countries through the State Department relating to medical and sanitary topics.

Through the division controlling maritime quarantine, 16,766 vessels were inspected during the last fiscal year at domestic, insular, and foreign stations, involving inspection also of 1,433,134 persons (passengers and crews) and the disinfection of 1,603 vessels on account of actual infection or for the destruction of rats and mosquitoes, the carriers of plague and yellow fever.

This division also supervises the medical inspection of immigrants. The diseases for which certification was made during the past fiscal year and the number of immigrants afflicted with same are as follows: Trachoma, a contagious disease of the eye, 3,220; favus, a contagious disease of the scalp, 102; tinea tonsurans, 100; tuberculosis, 140; insanity, 152; imbecility and idiocy, 176; feeble-mindedness, 151; epilepsy, 32; venereal, 213; diseases or defects affecting ability to earn living, 15,480; diseases or defects of less degree, 11,760.

In the immigration hospital at Ellis Island, N. Y., 8,649 patients were treated.

Under the division of domestic (interstate) quarantine may be mentioned investigation and aid in the matter of typhoid fever at Omaha, Chicago, and Williamson, W. Va., and investigations into typhoid among seamen and on vessels of the Great Lakes.

The operations through this division on the Pacific coast with regard to plague are too extensive to be here described, but it may be stated that no case of human or rat plague was found during the fiscal year due to infection in any of the cities of the coast. In San Francisco, Oakland, and Seattle 205,010 rats were destroyed. Of these 162,603 were examined in the federal laboratories and none found infected.

In the counties, however, out of 118,355 ground squirrels destroyed, 351 were infected. Four cases of human plague, contracted from infected squirrels, were reported during the year.

To prevent reinfection of San Francisco and Oakland, operations have been conducted in a zone around these cities to clear it of ground squirrels. Special measures have been taken to ascertain accurately the extent of the infection among ground squirrels, and with the cooperation of the state and county authorities to destroy all squirrels in the infected localities and to prevent extension of the infection.

The Division of Sanitary Reports and Statistics compiles and publishes each week a pamphlet entitled Public Health Reports. It contains a statistical report from all cities in the United States of more than 10,000 inhabitants, and some others, giving the morbidity and mortality in each city with regard to twelve diseases and the total mortality from all diseases. It contains also the weekly mortality in some 120 foreign cities from 13 communicable diseases. It gives special information concerning quarantinable diseases and sanitary measures in the United States and foreign countries. The foreign information is received through the United States consuls and service officers abroad.

Collective investigations are being made of the prevalence of pellagra, infantile paralysis, and leprosy.

A compilation is in preparation of state laws bearing upon the reporting of diseases, with a view to increasing the collection of morbidity statistics and bringing about improved methods and greater uniformity in their collection.

In the division of personnel and accounts are kept the records of the officers and of expenditures from the appropriations. The running expenses of the service are annually about \$2,000,000.

That the service keeps in touch with the medical profession at large and with sanitary movements is shown by the detail of officers to medical and sanitary associations, 47 meetings of such associations having been thus attended during the year; and by the contribution by the officers of 145 articles to the medical and lay press on professional subjects.

The miscellaneous division of the bureau has control of the issue of service publications, enumerated in part as follows: Annual Reports, Public Health Reports (weekly), reprints from the Public Health Reports, Public Health Bulletins, Bulletins of the Hygienic Laboratory, Bulletins of the Yellow Fever Institute, and the transactions of the annual conferences with state health authorities. Three hundred and sixty-four thousand copies of the various service publications were mailed during the last fiscal year.

The law which changed the name of the Marine-Hospital Service and made it a Public Health Service was approved July 1, 1902. This law fixed the status of the officers, enlarged the Hygienic Laboratory and gave it an advisory board, provided for the conferences with the state and territorial boards of health, provided for compilation and publication of statistics, and directed that the President should prescribe rules for the conduct of the service and the uniforms of its officers and employees.

It also provided for a Public Health and Marine-Hospital Bureau at Washington, and for the seven divisions of the bureau which have already been described.